

# PATENT SPECIFICATION

DRAWINGS ATTACHED

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924126



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## COMPLETE SPECIFICATION

### Method and apparatus for Subdividing Filter Plug Material for Mouthpiece Cigarettes

We, AMERICAN MACHINE & FOUNDRY COMPANY, a corporation organised and existing under the laws of the State of New Jersey, United States of America, located at 261 Madison Avenue, New York 16, State of New York, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a machine and method for supplying and cutting filter plugs for use in mouthpiece cigarette making machines, and particularly to that type of machine and method which will allow the length of mouthpiece cut to be adjusted as desired.

The length of cigarettes and mouthpieces produced by different manufacturers may vary, depending on the public's preference. Since this may also change from time to time, the length popular at one particular time may have to be altered at another.

An object of the invention is to provide a machine having positionally fixed rotating plug cutting knives, and adjustable stops and guide means for varying the relative position of the filter plug material with relation to the knives, so that predetermined plug lengths may be cut thereby.

Still another object of the invention is to provide improved means for severing multiple lengths of rods so that they will be of the uniform size.

Other objects and features of the invention will become apparent as the description of the particular physical embodiment, selected to illustrate the invention, progresses.

In the accompanying drawings, which form part of this specification, like characters of reference have been applied to corresponding parts throughout the several views which make up the drawings.

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Fig. 1 is a side elevation, partly in section, illustrating the component parts of the present apparatus.

Fig. 2 is a cross-sectional view showing the cutting mechanism and the adjustable plug guiding means.

Fig. 3 is a cross-sectional view of another embodiment of the invention.

My variable cigarette mouthpiece cutter consists of a mouthpiece hopper 10 into which a supply of sextuple lengths of mouthpieces are placed. Mouthpiece material is commonly purchased in sextuple lengths to facilitate handling. The embodiment of the mouthpiece cutting and aligning apparatus shown in Figure 1 consists of the inclined floor plate 12 of the hopper and the slanted side gate 14 which are agitated or oscillated by means of a suitable vibrator. In this embodiment this is accomplished by the cam roller 16 engaging with the hexagonal rotating cam 18. The agitator floor plate 12 has a spring mounting 20 at one end which permits the plate to be readily agitated when the filter tip attachment is operated.

The sextuple lengths of cigarette plugs 11 roll downwardly out through the space between the lower end of oscillating gate 14 and agitator floor plate 12 into the reservoir 22 made up of a side wall 24, a plug receiving and conveying drum 26 and the refuser wheel 28 (Fig. 1). The plug receiving and conveying drum 26 rotates in the direction indicated by the arrow and has plug receiving grooves 30 cut transversely across the periphery of the drum 26. As the drum 26 rotates and the grooves 30 pass under the reservoir 22 holding the sextuple lengths of filter plugs 11, an individual sextuple length of cigarette filter will fall under the action of gravity into each of the grooves or pockets 30.

In the event that two or more sextuple lengths of filter plug material partially fall into the same groove the rotating refuser wheel

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28 pushes back the excess, so that only one sextuple length of filter plug is allowed to remain in each pocket 30 when it passes under the stationary, spaced retaining wall 32.

5 The refuser wheel 28 is so constructed that the teeth on the refuser wheel 28 rotate in timed relationship with the flutes or pockets 30, in such relative angular position that a moving face is always present to remove any  
10 filter plug which may otherwise jam against the filter already nested in grooves 30 of drum 26.

The improvement of the present invention consists in providing means for relocating plug material prior to each cutting operation. As a  
15 result, it is possible to accommodate sextuple length plugs of various lengths for cutting into three equal duplex lengths. The length of the three sections produced can be readily changed  
20 to obtain a different duplex length than was previously gotten. Heretofore, it was impossible to achieve this result without relocating the cutting knives.

In the embodiment of the invention shown  
25 on Figure 2, stationary guide members 31 and 35 are alternately positioned on either side of the device. These guides can be moved in or out independently by means of a suitable screw adjustment 25 and 27 which can be set  
30 during the operation of the machine. By adjusting members 31 and 35, the lengths of the double lengths of the filter plug material which is severed can be readily controlled.

Mounted at first station  $R_1$  along retaining  
35 wall 32, air jet 33 pushes plug material against stop 31 to line up the same for cutting by the first rotary cutting knife 34, which extends beyond wall 32 and into an annular groove 37  
40 formed in drum 26. Knife 34 severs a double length from the sextuple length of filter plug material. Below knife 34 and non-axially therewith is a second rotary cutting knife 36, which also extends beyond bracket or wall 32 through  
45 a groove therein into an annular groove 39 in drum 26.

At station  $R_2$ , intermediate the two driven rotary knives, are other means for positioning the aligned assembly of the duplex and  
50 quadruple length of plug material so that the knife 36 will engage the quadruple length at a predetermined location for providing two duplex pieces of selected lengths (which may or may not be equal. In Figure 2 such means  
55 consist of a pusher 33a, which pushes the plug material toward a selectively positioned stop 35. Knife 36 then halves the quadruple length into two double lengths when equal lengths are desired.

As the drum 26 continues its rotation, the  
60 double lengths of filter tip material are held in the grooves 30 by means of the retaining wall 32 until they are brought above the pockets of the plug separating drums (not shown).

65 It should be appreciated that various means

may be employed for directing plug material against the stationary guides. I have shown several means for accomplishing this guiding or advancing action as for example, the air  
70 jet 33, the pusher 33a, and also, in the following embodiment spring guides preferably shaped into the form of a plow. There is shown on Figure 3 a variant of the invention employ-  
75 ing spring means to position the plug material. In this embodiment, 50 is an adjustable stationary guide stop identical with the previously described guide stops 31 and 35. Shaped into the form of a plow on the side  
80 opposite from guide stop 50 is a guide spring 52 held by means of brackets 51, 53 and 55, which may be moved in and out by a screw 57 through a rotatable connection 59. On the same side as guide stop 50, but below  
85 it, is secured a second guide stop 54. Opposite guide stop 54 is a second mechanical deflecting system having a plow or guide spring 56 adapted to contact the filter plug material 11. Guide spring 56 is secured by brackets 61, 63, and 65. A suitable screw means 69 is provided  
90 for moving the guide toward or away from the guide stop 54.

It will be evident from the foregoing that when the material to be subdivided is advanced  
95 on drum 26, each individual sextuple length of mouthpiece material 11 will first contact guide 52 and be pushed over against stop 50 before passing by the knife 34. The material so cut next contacts guide 56 which advances  
100 it up against guide stop 54 after which it passes through the second knife 36.

Because of the adjustable mounting for the stops and guides shown in Fig. 3, it is possible  
105 to accommodate a wide variation in lengths of mouthpiece material with this structure.

The arrangement shown in Fig. 3 also is  
110 very flexible for handling a wide variety of lengths of mouthpiece material to be subdivided without requiring a new plug cutting drum having a different knife spacing arrangement for each size plug material to be processed.

By alternating the advancing action as shown  
115 in Fig. 2, it is sometimes easier to handle mouthpieces having a greater degree of variation in length, since if the length has to be pushed over a considerable distance for the first cut, there will be suitable pushing means  
120 acting from the opposite direction to return the mouthpiece into proper position for the second cut.

Likewise while I have shown a blower and  
125 pusher combined on a single drum in Fig. 2; this was merely for purposes of illustration and two blowers or two pushers could be used for this purpose on the same drum.

The invention hereinabove described may,  
130 therefore, be varied in construction within the scope of the claims, for the particular device selected to illustrate the invention is but one of many possible embodiments of the same.

The invention, therefore, is not to be restricted to the precise details of the structure shown and described.

- We are aware of Patent Specification No. 833,998 which was not published at the application date of the present application, but which bears a date earlier than that of the present application.

WHAT WE CLAIM IS:—

- 10 1. The method of subdividing filter plug material for mouthpiece cigarettes which includes the steps of cutting a short plug from a long plug, at a first station, holding the short plug in alignment with the uncut remaining portion of the long plug, moving the aligned components from the first cutting station to another cutting station and cutting thereat the uncut portion of the long plug, the location of each cut being controlled with reference to an adjustable stop at each cutting station against which the long plug or components thereof is/are urged.
- 25 2. Method according to claim 1 including moving each long plug axially against a first adjustable stop, severing the long plug at said first stop, to provide a mouthpiece of predetermined length, moving the remaining portion of the long plug in axial alignment with the severed short plug up against a second adjustable stop and severing another predetermined length of mouthpiece from said remaining portion of the long plug.
- 30 3. Method according to claim 2 wherein the successive adjustable stops are disposed on the same side of the long plug.
- 35 4. Method according to claim 2 wherein the successive adjustable stops are disposed on opposite sides of the long plug.
5. Method according to any one of claims 1 to 4 wherein the said long plug is a sextuple length of mouthpieces for filter cigarettes and

each cut component of said long plug is a double length of said mouthpieces.

6. Apparatus for subdividing filter plug material for mouthpiece cigarettes which includes a main conveyor for receiving a long plug, a first cutting means for cutting a short plug from a long plug at a first station, means holding the short plug in alignment with the uncut remaining portion of the long plug while the aligned components are moved on the main conveyor from the first cutting station to a second cutting station, an adjustable stop adjacent each cutting station and means urging the long plug or a component thereof against each adjustable stop during the cutting operation thereat.

7. Apparatus according to claim 6 wherein said first and second cutting means are sharpened rotating knives spaced along said main conveyor.

8. Apparatus according to claim 6 or 7 wherein said main conveyor is a drum.

9. Apparatus according to any one of claims 6 to 8 wherein said urging means are resilient springs, air jets or pushers.

10. Apparatus according to any one of claims 6 to 9 wherein the adjustable stops are located on one side of said main conveyor.

11. Apparatus according to any one of claims 6 to 10 wherein the adjustable stops are located on opposite sides of said main conveyor.

12. Apparatus according to any one of claims 6 to 11 wherein the long plug is a sextuple length of mouthpieces for filter cigarettes and each short plug is a double length of said mouthpieces.

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FIG. 1

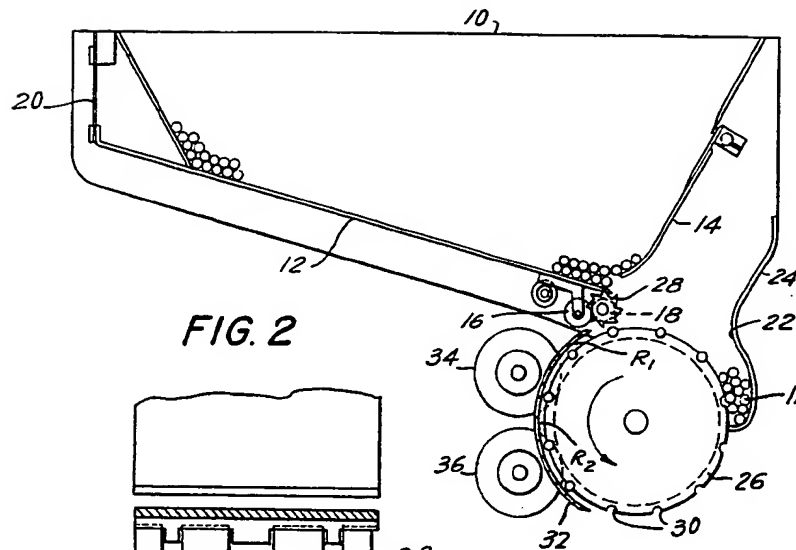


FIG. 2

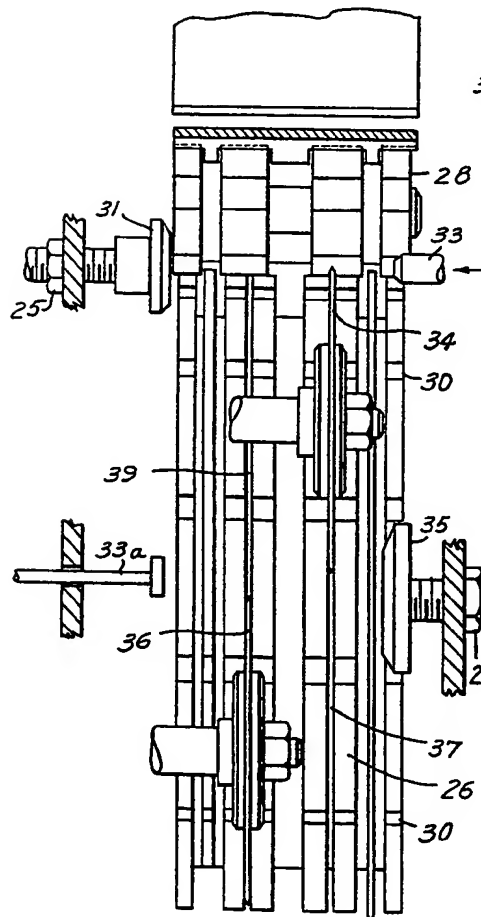


FIG. 3

